

## CONTENTS

PART I. DECLARATION OF THE RECORD OF DECISION .....	iii
Site Names and Location .....	iii
Statement of Basis and Purpose .....	iii
Assessment of the Site .....	iv
Description of the Selected Remedies .....	iv
Statutory Determination.....	vi
RECORD OF DECISION DATA CERTIFICATION CHECKLIST .....	viii
U.S. DEPARTMENT OF ENERGY IDAHO OPERATIONS OFFICE SIGNATURE SHEET .....	ix
U.S. ENVIRONMENTAL PROTECTION AGENCY SIGNATURE SHEET .....	xi
IDAHO DEPARTMENT OF HEALTH AND WELFARE SIGNATURE SHEET .....	xiii
ACRONYMS .....	xxiii
PART II—DECISION SUMMARY .....	1-1
1. SITE NAME, LOCATION, AND BRIEF DESCRIPTION .....	1-1
2. SITE HISTORY AND ENFORCEMENT ACTIVITIES .....	2-1
2.1 INEEL History.....	2-1
2.2 CFA History .....	2-1
2.3 WAG 4 Enforcement Activities .....	2-1
2.3.1 CERCLA Actions.....	2-2
3. HIGHLIGHTS OF COMMUNITY PARTICIPATION .....	3-1
4. SCOPE AND ROLE OF OPERABLE UNIT OR RESPONSE ACTION .....	4-1
4.1 Remedial Action Sites .....	4-1
4.2 No Action and No Further Action Sites .....	4-1
4.3 Groundwater .....	4-4
5. SITE CHARACTERISTICS .....	5-1

5.1	Physical Characteristics.....	5-1
5.2	Climate .....	5-2
5.3	Flora and Fauna .....	5-2
5.4	Demography .....	5-3
5.5	Cultural Resources.....	5-3
5.6	Conceptual Site Models.....	5-5
6.	CURRENT AND POTENTIAL SITE AND RESOURCE USES.....	6-1
6.1	Current Land Use .....	6-1
6.2	Future Land Use .....	6-1
6.3	Groundwater Use.....	6-3
6.4	Groundwater Classification and Basis.....	6-3
7.	BASELINE RISK ASSESSMENT METHODOLOGY .....	7-1
7.1	Human Health Risk Evaluation Summary.....	7-1
7.1.1	Data Evaluation .....	7-1
7.1.2	Exposure Assessment .....	7-2
7.1.3	Toxicity Assessment.....	7-4
7.1.4	Risk Characterization .....	7-5
7.1.5	Qualitative Uncertainty Analysis.....	7-7
7.2	Ecological Risk Evaluation Summary .....	7-12
7.2.1	Problem Formulation .....	7-12
7.2.2	Analysis .....	7-12
7.2.3	Risk Characterization .....	7-15
7.2.4	Transition to the INEEL-Wide Ecological Risk Assessment .....	7-16
7.3	Risk Assessment Summary.....	7-16
8.	CONTAMINATED SOIL SITES CFA-04, CFA-08, AND CFA-10 .....	8-1
8.1	CFA-04 Pond (OU 4-05) .....	8-1

8.1.1	Site Investigations .....	8-1
8.1.2	Nature and Extent of Contamination.....	8-2
8.1.3	Summary of Site Risks .....	8-2
8.2	CFA-08 Sewage Plant Drainfield (OU 4-08) .....	8-4
8.2.1	Site Investigations .....	8-4
8.2.2	Nature and Extent of Contamination.....	8-6
8.2.3	Summary of Site Risks .....	8-6
8.3	CFA-10 Transformer Yard (OU 4-09) .....	8-7
8.3.1	Site Investigations .....	8-7
8.3.2	Nature and Extent of Contamination.....	8-7
8.3.3	Summary of Site Risks .....	8-7
9.	REMEDIAL ACTION OBJECTIVES AND FINAL REMEDIATION GOALS .....	9-1
9.1	Remedial Action Objectives .....	9-1
9.2	Final Remediation Goals for the Selected Alternatives.....	9-1
10.	DESCRIPTION OF ALTERNATIVES.....	10-1
10.1	Alternative 1—No Action (With Monitoring).....	10-1
10.2	Alternative 2—Limited Action.....	10-1
10.3	Alternative 3—Excavation, Treatment, and Disposal .....	10-2
10.3.1	Alternative 3a—Removal, On-INEEL Treatment, and Disposal .....	10-2
10.3.2	Alternative 3b—Removal, Treatment, and Disposal Off-INEEL .....	10-3
10.4	Alternative 4—Containment and Institutional Controls.....	10-4
11.	SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES .....	11-1
11.1	Threshold Criteria.....	11-1
11.1.1	Overall Protection of Human Health and the Environment.....	11-1
11.1.2	Compliance with Applicable or Relevant and Appropriate Requirements.....	11-2
11.2	Balancing Criteria.....	11-3

11.2.1	Long-Term Effectiveness and Permanence .....	11-3
11.2.2	Reduction of Toxicity, Mobility, or Volume Through Treatment.....	11-3
11.2.3	Short-Term Effectiveness .....	11-4
11.2.4	Implementability.....	11-4
11.2.5	Cost.....	11-5
11.3	Modifying Criteria.....	11-5
11.3.1	State Acceptance .....	11-5
11.3.2	Community Acceptance .....	11-6
12.	SELECTED REMEDY.....	12-1
12.1	Description of Selected Remedy .....	12-1
12.1.1	CFA-04 Pond (OU 4-05) .....	12-1
12.1.2	CFA-08 Sewage Plant Drainfield (OU 4-08) .....	12-2
12.1.3	CFA-10 Transformer Yard (OU 4-09) .....	12-3
12.2	Institutional Controls .....	12-4
12.3	Estimated Costs for the Selected Remedies.....	12-6
13.	STATUTORY DETERMINATIONS.....	13-1
13.1	CFA-04 Pond.....	13-1
13.1.1	Protection of Human Health and the Environment.....	13-1
13.1.2	Cost-Effectiveness.....	13-1
13.1.3	Use of Permanent Solutions and Alternative Treatment Technologies.....	13-1
13.1.4	Preference for Treatment as a Principal Element .....	13-1
13.1.5	Five-Year Reviews .....	13-4
13.2	CFA-08 Sewage Plant Drainfield (OU 4-08) .....	13-4
13.2.1	Protection of Human Health and the Environment.....	13-4
13.2.2	Cost-Effectiveness .....	13-4
13.2.3	Use of Permanent Solutions and Alternative Treatment Technologies.....	13-4

13.2.4	Preference for Treatment as a Principal Element .....	13-5
13.2.5	Five-Year Reviews .....	13-5
13.3	CFA-10 Transformer Yard (OU 4-09) .....	13-5
13.3.1	Protection of Human Health and the Environment.....	13-5
13.3.2	Cost-Effectiveness.....	13-5
13.3.3	Use of Permanent Solutions and Alternative Treatment Technologies.....	13-5
13.3.4	Preference for Treatment as a Principal Element .....	13-6
13.3.5	Five-Year Reviews .....	13-6
14.	DOCUMENTATION OF SIGNIFICANT CHANGES.....	14-1
14.1	Modification of the Preferred Alternative for CFA-08.....	14-1
14.2	CFA-04 Information .....	14-1
14.3	OU 4-13A Interim Action Proposed Plan.....	14-1
14.4	Ecological Sites and Risks.....	14-2
15.	REFERENCES.....	15-1
	Part III. RESPONSIVENESS SUMMARY .....	III-1-1

Appendix A—Oral and Written Public Comments

## **FIGURES**

1-1.	Location of WAG 4 at the INEEL.....	1-2
1-2.	CERCLA sites and groundwater monitoring wells at WAG 4.....	1-3
5-1.	Counties surrounding the INEEL .....	5-4
5-2.	Conceptual site model for contaminated soil sites at CFA.....	5-6
5-3.	Conceptual site model for underground storage tanks and buried waste sites at CFA.....	5-7
5-4.	Conceptual site model for liquid discharge sites at CFA. ....	5-8
5-5.	Complete conceptual site model for ecological receptors at WAG 4.....	5-9
6-1.	Land ownership distribution in the vicinity of the INEEL and on-INEEL areas open for permitted grazing. ....	6-2

8-1.	Pond (CFA-04) .....	8-3
8-2.	Sewage Plant Drainfield (CFA-08). ....	8-5
8-3.	The Transformer Yard site (CFA-10).....	8-8

## TABLES

4-1.	Summary of WAG 4 Sites.....	4-2
7-1.	BRA human health assessment uncertainty factors.....	7-8
7-2.	Summary of source-term uncertainties site with selected remedies.....	7-11
7-3.	Sources and effects of uncertainties in the ecological risk assessment. ....	7-17
7-4.	Summary of major risks and hazard quotients at individual sites and contaminants of concern that are addressed by the selected remedy for WAG 4. ....	7-18
8-1.	Summary data for the human health and ecological COC at the CFA-04 Pond. ....	8-2
8-2.	Summary of data for human health COCs at the CFA-08 drainfield. ....	8-6
8-3.	Summary of data for the human health and ecological COCs at the CFA-10 Transformer Yard. ....	8-9
9-1.	Final Remediation Goals for sites with selected alternatives.....	9-2
11-1.	Relative ranking of alternatives evaluated for the three WAG 4 OU 4-13 sites of concern. <sup>a</sup> .....	11-2
11-2.	Costs for the alternatives considered for CFA-04, CFA-08, and CFA-10. ....	11-6
12-1.	Institutional control evaluation for WAG 4 sites. ....	12-8
12-2.	Institutional control requirements for WAG 4 remediated sites.....	12-18
12-3.	Cost estimate summary for selected remedy at OU 4-13: Pond (CFA-04), SP Drainfield (CFA-08), and Transformer Yard (CFA-10).....	12-22
13-1.	ARARs and TBCs for the selected remedies for CFA-04, CFA-08, and CFA-10.....	13-2

## **ACRONYMS**

ALARA	as low as reasonably achievable
AR	Administrative Record
ARAR	applicable or relevant and appropriate requirements
ASA	Auditable Safety Analysis
bgs	below ground surface
BLM	U.S. Bureau of Land Management
BRA	baseline risk assessment
CAB	Citizen's Advisory Board
CEL	Chemical Engineering Laboratory
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	CERCLA Information System
CFA	Central Facilities Area
CFLUP	Comprehensive Facility Land Use Plan
CFR	Code of Federal Regulations
COC	contaminant of concern
COPC	contaminant of potential concern
DOE	U.S. Department of Energy
DOE-ID	U.S. Department of Energy Idaho Operations Office
EPA	U.S. Environmental Protection Agency
ERA	ecological risk assessment
FFA/CO	Federal Facility Agreement and Consent Order
FRG	final remediation goals
GFE	government furnished equipment
HI	hazard index

HQ	hazard quotient
HSP	Health and Safety Plan
IC	Institutional control
ICDF	INEEL CERCLA Disposal Facility
ICP	Institutional Control Plan
IDAPA	Idaho Administrative Procedures Act
IDHW	Idaho Department of Health and Welfare
INEL	Idaho National Engineering Laboratory
INEEL	Idaho National Engineering and Environmental Laboratory
INTEC	Idaho National Technical and Engineering Center
IRIS	Integrated Risk Information System
LOAEL	lowest observed adverse effects level
MCL	maximum contaminant level
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NOAEL	no observed adverse effects level
NPL	National Priorities List
NPV	net present value
NRTS	National Reactor Testing Station
UCL	upper confidence limits
O&M	operation and maintenance
OU	operable unit
PCB	polychlorinated biphenyl
RAO	remedial action objective
RBC	risk based concentration

RCRA	Resource Conservation and Recovery Act
RD/RA	remedial design/remedial action
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
SF	slope factor
SGS	segmented gate separation
SP	sewage plant
SRPA	Snake River Plain Aquifer
TBC	to-be-considered
TCLP	Toxicity Characteristic Leaching Procedure
TRV	toxicity reference value
TSDF	Treatment, Storage, and Disposal Facility
UCL	upper confidence limit
UST	underground storage tank
VOC	volatile organic compound
WAG	Waste Area Group

